Polycom® SoundStructure

Frequently Asked Questions

What are the SoundStructure products?

The SoundStructure products are Polycom's next generation installed voice products. They are rack mounted audio products that are available in a 16x16, 12x12, and 8x8 form factor and are called the C16, C12, and C8 respectively.

In addition there is a sound reinforcement product called the SR12 that is a 12x12 device that can be used for non-conferencing audio applications such as speech reinforcement, paging, etc.

What are the main differences between SoundStructure and Vortex?

There are a number of differences between the two products but the main differences are:

- SoundStructure products have more advanced processing such as stereo echo cancellation and feedback elimination that is available on every input
- SoundStructure products connect to Polycom HDX video codecs via the Clink2 digital interface
- SoundStructure products scale to larger systems (128 microphones vs. 64 microphones for Vortex) easily due to the OBAM interface

What does OBAM™ mean and why is it important?

OBAM means One Big Audio Matrix and it is important because it simplifies larger installs by making multiple SoundStructure devices appear as one large device rather than as multiple smaller devices. This means that all the input signals from all devices are available to all the outputs from the system. The audio from any input may be routed to any output.

How many signals are shared on the OBAM bus between devices?

There are hundreds of signals that are shared across the OBAM link when multiple devices are linked.

Can I still use my favorite microphones with SoundStructure?

Absolutely. Nearly any analog microphone can be used with SoundStructure products. The SoundStructure products provide up to 64dB of input gain (the Vortex provides up to 63dB of gain) and therefore can be used with any analog microphone that has a sensitivity of about 6mV/Pa (-44dBV/Pa) or greater. In addition the Polycom HDX microphone array and HDX Ceiling Microphone Array can be used.

Do I need special microphones to take advantage of the 22kHz stereo AEC on SoundStructure?

No. Any analog microphone can be used with the SoundStructure products. Even if the microphone frequency response is limited, it will work well with SoundStructure products, though the frequency response will be limited to the capabilities of the microphone.

What does stereo acoustic echo cancellation (AEC) mean?

Stereo AEC means that the echo canceller can cancel echoes from two completely independent sources of remote audio that are played into the local room from two different sets of loudspeakers. The two independent

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sources of remote audio could come from a Polycom stereo video codec (left and right audio) or from two or more monaural sources, such as two mono video codecs or multiple telephony interfaces that are mixed into two independent sets of loudspeakers. Traditional conferencing equipment can cancel echoes from one independent loudspeaker system. There may be multiple sources mixed together into that one loudspeaker system (such as mono video and telephony) but there is no "spatial" positional information that can be leveraged with traditional conferencing equipment.

How is stereo AEC different from traditional acoustic echo cancellation?

Stereo AEC enables the use of positional information to enhance the audio experience and improve intelligibility and talker identification. For instance, the video conferencing audio could be played from a set of loudspeakers in the front of the room and telephony audio could be played from overhead loudspeakers. This makes it easier for the local room participants to know who is speaking at any given time. Due to the stereo AEC processing, the acoustic echo paths from both sets of loudspeakers can be simultaneously echo cancelled – preventing any echo from being heard by either set of remote talkers (remote video or audio participants). In traditional conferencing applications, this configuration would cause acoustic echoes to be heard by the remote talkers as they alternated speaking until the monaural AEC reconverged to the different paths, and if both sets of remote participants were speaking, a constant residual echo would be heard by both remote parties.

Are special microphones requires to operate with the stereo acoustic echo cancellation (AEC) on the SoundStructure products?

No. The stereo AEC on the SoundStructure works with traditional microphones or Polycom HDX microphones. The stereo processing refers to the fact that the echo paths are coming from two independent loudspeakers and cancelled after the echoes are picked up by the microphones.

What will happen to the Vortex products?

The Vortex products will continue to be available. The Vortex products provide outstanding audio conferencing quality at a lower price point than the SoundStructure products. In addition there are many applications where the Vortex products are the right choice of product due to the built-in telephony interface and audio amplifier.

Can I bus Vortex products to SoundStructure products with EF Bus?

No, the Vortex products and SoundStructure products have different bussing interfaces. The SoundStructure linking mechanism – OBAM™ – is much higher speed and cannot be used with EF Bus.

Can I use the EF2201 with SoundStructure products?

No, the EF2201 links to other Vortex products over the EF Bus and the bussing is different from the bussing used with SoundStructure products.

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Any Vortex product (EF2280, EF2241, EF2210, and EF2211) could be used with the analog input/output to the SoundStructure products.

Are there any SoundStructure product bundles with Polycom HDX video products?

There are presently no bundles with the Polycom HDX products. However depending on demand we may create some product bundles with the Polycom HDX products and SoundStructure products.

Do I have to use the Polycom HDX microphones with SoundStructure?

No. The Polycom HDX microphones can be used with SoundStructure products but they don't have to be used.

Can I use the Polycom HDX microphones with SoundStructure even if I'm not using a Polycom HDX video conferencing system?

Yes. The Polycom HDX microphones can be used with SoundStructure products in any application – audio conferencing, video conferencing, or even sound reinforcement applications.

Can I use the Polycom HDX microphones with SoundStructure and reinforce the microphones into the local room and use them for conferencing?

Yes, The Polycom HDX microphones can be used for in-room sound reinforcement as well as for sending audio to the remote participants. Because of the matrix in SoundStructure devices, there is the ability to route individual HDX microphones independently and utilize the feedback processing to provide additional robustness for reinforcement.

In any reinforcement application, reinforcement always works better if the microphone to be reinforced is close to the local talker who is being reinforced. This provides a cleaner signal to the microphone (due to its proximity) and more gain before feedback in the room because the microphone picks up less of the reinforced audio from the loudspeakers (due to the microphone being close to the talker and far from the loudspeaker).

If the HDX ceiling microphone is used, it will be important to ensure there is some reasonable isolation between the microphones and the loudspeakers – and the system should be zoned in a mix-minus fashion, i.e., multiple loudspeakers fed by different amplifier outputs and mics in each loudspeaker zone are not reinforced into that zone and perhaps not in adjacent zones.

Can I use the SoundStructure devices with other video codecs or only with the Polycom HDX system?

The SoundStructure products can be used with any video conferencing system where the internal AEC on the video conferencing product can be disabled. This includes nearly every video codec product on the market.

Why do I need to disable the AEC on a video codec that I connect to SoundStructure products?

When SoundStructure products are used with a video conferencing system, the AEC processing would be performed by the SoundStructure product on a

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microphone-by-microphone basis. The SoundStructure device would remove the echoes and background noise, automix the microphones, and send that audio to the video codec.

If the AEC is also enabled on the video codec then the video codec would try to remove echoes that have already been removed by the SoundStructure products. The additional processing on the audio signal could degrade the audio quality and reduce the full-duplex nature of the system without adding any additional value.

What is CLink2?

CLink2 is the digital interface used by Polycom SoundStructure and HDX products to communicate to each other and to the digital microphone arrays.

Can I digitally connect SoundStructure with my VSX video codecs? How about with SoundStation VTX 1000?

The CLink2 interface is not available on the VSX video codecs – only on the HDX video codecs - so it is not possible to connect the SoundStructure to the VSX products via a digital interface. It is possible to connect the SoundStructure products to the VSX via analog input and output connections.

The SoundStructure products can be connected to the SoundStation VTX1000 via analog input and output connections in the same manner that a Vortex is connected to the SoundStation VTX1000.

Is SoundStructure API backwardly compatible with Vortex?

No, there is a new API for SoundStructure devices.

The SoundStructure system architecture has been designed to simplify the entire integration process, including the control system code development. The new architecture has features such as OBAM, virtual channels, and virtual channel groups, that remove the need to know about device types, device ID's, and other hardware specific details.

Because of these advances, the control code API has been streamlined and is much more readable and understandable than previous API's.

Virtual channels also allow the control system application be portable and easily reusable. By controlling a SoundStructure system with virtual channel names such as "Podium Mic", the control system application doesn't need to know what the underlying physical channels are. This also speeds the control system development time because it's easier to understand what is being controlled when the actual names can be used rather than having to know that it is "input 5 on device 03", for example.

What is a virtual channel? And what's virtual about them?

A virtual channel is the way that SoundStructure products refer to the actual inputs and outputs from the system. A virtual channel is defined with a label and the underlying physical connection (e.g., input 3 or output 15) and then the entire system can then be

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configured by solely referring to the virtual channel names of the inputs and outputs. This means that rather than referring to input 5 on device 03, it is possible to simply refer to an input as "Podium Mic" and the SoundStructure device will translate the virtual channel names to the underlying physical channels.

The virtual channel concept simplifies the configuration and the control system programming, and has the added benefit that the control system code is now more portable so it can be re-used without having to rewrite it for different installations that may have different wiring and different numbers of inputs and outputs but use the same virtual channel names.

The "virtual" in virtual channel means that it's an abstraction layer over the physical channel – so the virtual channel only exists as a wrapper around one or more physical channels.

Virtual channels also make it easy to work with stereo signals – a stereo input signal can be referenced as a single virtual channel, such as VCR. All routing and configuration of the virtual channel will affect both the left and the right channels but the settings will be applied to the single virtual channel name. This simplifies routing and control as only one "virtual channel" needs to be configured rather than being concerned with the two underlying "physical channels".

Do any SoundStructure models come with built-in telephony?

Each SoundStructure model has a modular slot in the back for telephony cards. Single-line and dual-line PSTN cards are available today, and they can be swapped for other options that will be available in the future.

Is there a VoIP telephony card available?

There is no VoIP card available today, though we are planning on future availability of a VoIP option. Any cards that are available in the future can be plugged directly into the modular telephony slot in the back of any SoundStructure model.

Why isn't there a stand-alone telephony interface that can be linked to the other devices to form a bridge?

Each SoundStructure product can support a telephony plug-in card that supports either one or two analog telephone lines, depending on which telephony plug-in card is selected. By being able to link up to eight SoundStructure devices together, that creates up to sixteen telephone lines that could be used simultaneously.

The vast majority of applications require one or possibly two telephone lines – a solution that is provided with SoundStructure products – and provided in a single rack form factor.

When more than two lines are required, it is possible to link multiple SoundStructure devices together and use their telco cards. However, it may be more practical to use bridging equipment or a bridging service to

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provide additional flexibility (scheduling, ad-hoc, logging, billing, etc) and/or cost advantages.

I often have more microphone inputs than outputs. Will there be an 8 input device with no outputs to provide a lower cost way of adding additional microphones when I don't want more outputs?

SoundStructure C16, C12, and C8 devices have 16x16, 12x12, and 8x8 form factors, respectively, which makes it easy to mix and match to build up to a total of 128 inputs. Any of the inputs of these devices can be used with microphone signals – so the C12 device, for examples, supports 12 microphone inputs in contrast to other manufacturers' products where a 12-input device only support 8 microphone inputs.

There are no input-only SoundStructure devices at the present time, as the cost savings from removing the additional outputs would not result in significant cost savings. In addition, if you compare SoundStructure with other products with similar capacity, you will find it to be priced very competitively.

Do you have a SoundStructure model with less than 8 inputs? In some deployments, I may only need one or two inputs.

The lowest number of inputs available on SoundStructure is 8, with the C8 model. There are Vortex models that are lower priced with fewer inputs available, such as the EF2241.

Why is there no front panel display on the SoundStructure devices?

The SoundStructure devices do have a status LED on the front of the device to indicate whether the system is functional (green), has a warning (yellow), or has a serious warning (red).

Due to the comprehensive feature set and the powerful metering capabilities of the SoundStructure devices, we wanted customers to use the SoundStructure Studio software to configure the devices properly and expeditiously. There are many design and configuration innovations in SoundStructure Studio that would have been impossible to replicate through a front panel user interface and still keep the one rack-unit form factor.

For customers that want the flexibility of a front panel display, the Vortex products offer a complete conferencing solution with front panel display and controls.

How is the SR12 different from the C12, and where would I use one instead of the other?

The SoundStructure SR12 does not include acoustic echo cancellation, and is designed specifically for sound reinforcement environments where echo cancellation is not needed. The C12 (or other C-series model) would be used in environments that do need echo cancellation from audio and video conferencing sources.

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What are the benefits of using the SR12 for sound reinforcement?

The SoundStructure SR12 offers a number of audio processing features, such as feedback elimination, dynamics processing, and advanced equalization options, that add tremendous value to sound reinforcement applications. Plus, the OBAM link makes it easy to scale for large numbers of inputs and outputs, and the SoundStructure Studio software greatly simplifies the design and installation process. In addition, if you are already familiar with how to install the C-series products, you already know how to install the SR12 as well.

Why is the SoundStructure SR12 more expensive than the ClearOne PSR1212?

The SoundStructure SR12 supports 50% more microphone inputs than the ClearOne PSR1212 and provides substantially more processing than the PSR1212, including noise cancellation and feedback elimination on all the inputs, more extensive equalization, dynamics processing, submixing, a scalable matrix, built-in Ethernet interface, and even a slot for future expansion.

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